**description of the course of study**

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| **Course code** | **0912-7LEK-F-6-NT** | |
| **Name of the course in** | Polish | **Nowoczesne techniki mikroskopowe w medycynie** |
| English | **Modern microscopic techniques in medicine** |

1. **LOCATION OF THE course OF STUDY within the system of studies**

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| **1.1. Field of study** | Medicine |
| **1.2. Mode of study** | Full-time |
| **1.3. Level of study** | Uniform Masters’ studies |
| **1.4. Profile of study\*** | General academic |
| **1.5. Person preparing the course description** | Dr Małgorzata Łysek-Gładysińska |
| **1.6. Contact** | mglad@ujk.edu.pl |

1. **General characteristicS of the course of study**

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| **2.1. Language of instruction** | English |
| **2.2. Prerequisites\*** | lack |

1. **DETAILED CHARACTERISTICS OF THE COURSE OF STUDY**

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| * 1. **Form of classes** | | classes: 15 h (including 5 e-learning) |
| * 1. **Place of classes** | | Traditional classes in didactic classroom WLiNoZ UJK |
| * 1. **Form of assessment** | | Credit with grade |
| * 1. **Teaching methods** | | Informative lecture |
| * 1. **Bibliography** | **Required reading** | 1. A. L. Mescher. Junqueira’s Basic Histology Text& Atlas 13th Edition  2. M.J. Dykstra , L.E. Reuss . Biological Electron Microscopy. Theory, Techniques and Troubleshooting 2nd Edition. |
| **Further reading** | 1. X.Chen, B. Zhen, H. Liu. Optical and digital microscopic imaging techniques and applications in pathology. Anal Cell Pathol. 2011; 34 (1-2): 5-18 |

1. **Objectives, syllabus CONTENT and intended teaching outcomes**

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| * 1. **Course objectives *(including form of classes)***   *C1.-* Acquaintance with the basic microscope techniques used in medical research.  *C2.-* Acquaintance with the correct principles of collecting and preserving the biological material for microscopic research.  C3- Ability to analyze cell structure at the level of light and electron microscopes using modern microscopic techniques. |
| * 1. **Detailed syllabus *(including form of classes)***   The principles of operation of modern types of light microscopes (phase-contrast, interference-polarizing microscopes). Fluorescence microscopy: preparation techniques and selection of fluorochromes. Confocal microscope. Basic types of transmission electron microscopes (TEM) and scanning microscopes(SEM). The principles of collecting and preserving the test materials, methodologyfor preparing paraffin sections. Microtome sectioning.Staining methods. Sample preparation for transmission electron microscopy (TEM).Application of modern microscopic techniques in medicine. |

* 1. **Education outcomes in the discipline**

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| **Code** | **A student, who passed the course** | **Relation to learning**  **outcomes** |
| within the scope of **knowledge**, the graduate knows and understands: | | |
| W01 | basic cellular structures and their functional specifications; | A.W4. |
| W02 | the processes such as: cell cycle, proliferation, differentiation, and cell aging, apoptosis and necrosis, and their importance for the functioning of the body. | B.W18. |
| within the scope of **ABILITIES**, the graduate knows how to: | | |
| U01 | recognize histological structures of organs, tissues, cells and cellular structures on the optical and electron microscope images, describe and interpret the structure and relations between the structure and the function. | A.U2. |

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|  | within the scope of **SOCIAL COMPETENCE**, the graduate is able to: |  |
| K01 | establish and maintain deep and respectful contact with the patient and show understanding towards ideological and cultural differences; | H.S1 |
| K02 | do what is right for the patient; | H.S2 |
| K03 | respect medical confidentiality and patient’s rights; | H.S3 |
| K04 | take actions concerning the patient on the basis of ethical principles, being aware of social conditions and restrictions resulting from illness; | H.S4 |
| K05 | recognize his/her own limitations and self-evaluate educational deficiencies and needs; | H.S5 |
| K06 | ife st ife s ife style; | H.S6 |
| K07 | use reliable information sources; | H.S7 |
| K08 | conclude on the basis of own surveys and observations; | H.S8 |
| K09 | introduce rules of social conduct and teamwork to the group of specialists, including specialists form other medical professions also in the multicultural and multinational environment; | H.S9 |
| K10 | give opinions concerning various aspects of professional activity; | H.S10 |
| K11 | take responsibility for own decisions made during professional activities including own safety and safety of other people; | H.S11 |

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| * 1. **Methods of assessment of the intended learning outcomes** | | | | | | | | | | | | | | | | | | | | | |
| **Teaching**  **outcomes**  ***(code)*** | **Method of assessment (+/-)** | | | | | | | | | | | | | | | | | | | | |
| **Exam oral/written\*** | | | **Test\*** | | | **Project\*** | | | **Effort**  **in class\*** | | | **Self-study\*** | | | **Group work\*** | | | **Others\***  **Observation** | | |
| ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | | ***Form of classes*** | | |
| *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* | *L* | *C* | *…* |
| W01 |  |  |  |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| W02 |  |  |  |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U01 |  |  |  |  | ***+*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| K01-K11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | ***+*** |  |

***\*delete as appropriate***

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| * 1. **Criteria of assessment of the intended teaching outcome**   The final grade is obtained on the basis of the final exam and attendance at the lectures | | |
| **Form of classes** | **Grade** | **Criterion of assessment** |
| **lecture (L)** | **3** | Achievement 61% - 68% of the total number of points from test |
| **3,5** | Achievement 69% - 76% of the total number of points from test |
| **4** | Achievement 77% - 84% of the total number of points from test |
| **4,5** | Achievement 85% - 92% of the total number of points from test |
| **5** | Achievement 93% - 100% of the total number of points from test |

* [**Thresholds**](https://pl.bab.la/slownik/angielski-polski/thresholds) **are valid from 2018/ 2019 academic year**

1. **BALANCE OF ECTS CREDITS – STUDENT’S WORK INPUT**

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| **Category** | **Student's workload** |
| **Full-time**  **studies** |
| *NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/* | **15** |
| *Participation in lectures\** |  |
| *Participation in classes, seminars, laboratories\** | **10** |
| *Preparation in the exam/ final test\** |  |
| *Others\** | **51** |
| *INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/* | **10** |
| *Preparation for the lecture\** |  |
| *Preparation for the classes, seminars, laboratories\** | **10** |
| *Preparation for the exam/test\** |  |
| *Gathering materials for the project/Internet query\** |  |
| *Preparation of multimedia presentation* |  |
| *Others\** |  |
| *TOTAL NUMBER OF HOURS* | **25** |
| ECTS credits for the course of study | **1** |

***Accepted for execution*** *(date and signatures of the teachers running the course in the given academic year)*

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1 e-learning (without participation of the lecturer)